REMARKS

Reconsideration and allowance of this application are respectfully requested in view of the amendments above and the remarks below.

Telephone Interview

Applicants gratefully appreciate the time afforded by Examiner Crepeau during a telephone interview with applicants' attorney on January 31, 2007 regarding the final Office Action.

Allowed Claims

Initially, applicants gratefully appreciate the allowance of claims 1, 5, 7, 8, 10-15, 18-24, 26, 28, 31, 32, 36, 36-42, and 45. No limitation on the scope of these claims should be inferred from the remarks below since these claims have already been indicated as being allowable.

35 U.S.C. §112 Rejection

In the Office Action, claims 2-4, 6, 16, 17, 25, 27, 29, 33-35, 37, 43, 44, and 46 were rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. In particular, allegedly each of the instant claims makes reference to "purified hydrogen" or a "PEM electrochemical fuel cell," however, independent claims 1, 22, 31, and 40 recite a solid oxide fuel cell or functions to purify oxygen. Applicants respectfully traverse this rejection for the reasons below.

Briefly summarized, the present invention is directed to devices that can act as both an electrochemical cell and an ion pump. For example, a combination electrochemical cell and ion pump may be configured to operate as a fuel cell by supplying reactants such as fuel and oxidant to the electrochemical cell and applying an electrical load across the electrochemical cell. In addition, the electrochemical cell

may be configured to operate as an ion pump by applying an electrical potential across the electrochemical cell and supplying one of the reactants. For example, the device may be configured to operate as a hydrogen pump to purify hydrogen by applying an electrical potential across the electrochemical cell and supplying the fuel (e.g., reformate) while restricting the supply of oxidant to the electrochemical cell. The device may also be configured to operate as an oxygen pump to purify oxygen by applying an electrical potential across the electrochemical cell and supplying the oxidant (e.g., air) while restricting the supply of fuel to the electrochemical cell. Thus, various types of electrochemical cells (e.g., PEM, solid oxide, etc.) may be employed as a fuel cell or ion pump by suitably permitting or restricting the supplies of reactants to the electrochemical cell and whether an electrical load or electrical potential is applied to the electrochemical cell. Accordingly, the combination electrochemical cell and ion pump, depending on how it is configured and operated, and what reactants are supplied, may act as a fuel cell, a hydrogen pump, or an oxygen pump.

In an effort to expedite the allowance of the application, the claims have been amended to more clearly recite various aspects of applicants' invention. In particular, claim 1 has been amended for clarification to remove reference to at least one of purify hydrogen and purify oxygen, and instead recite a combination fuel cell and ion pump wherein the ion pump is operable as a hydrogen pump to purify hydrogen. Accordingly, claims 6-8, 18, and 19 have been canceled.

In addition, independent method claim 22 has been similarly amended as was claim 1. Independent claim 31, which is directed to an oxygen infrastructure system, has been amended for clarification to remove reference to hydrogen. Independent claim 40, which is directed to operating the electrochemical cell by blocking fuel to the anode inlet and applying an electrical potential to the electrochemical cell to purify oxygen, has been amended for clarification by removing reference to purifying hydrogen. Accordingly, claims 33-35, 37, 43, and 44 have been canceled.

While the above amendments were made for clarification, it will be appreciated that by permitting and/or restricting the flow or reactants, the claimed combination electrochemical cell and hydrogen pump may further be operated as an oxygen pump, and the claimed combination of the electrochemical cell and oxygen pump may also further be operated as a hydrogen pump. No limitation on the scope of the amended claims in regard to this aspect of applicants' invention should be inferred from the above amendments.

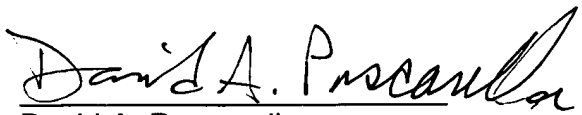
It is respectfully submitted that the §112 rejection is overcome. Withdraw of the §112 rejection is respectfully requested.

CONCLUSION

It is respectfully submitted that the application is in condition for allowance, and such action is respectfully requested.

If a telephone conference would be of assistance in advancing the prosecution of the subject application, applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,



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Dated: March 19, 2007

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